

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

**EP 0 822 404 A3**

(12)

**EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
03.11.1999 Bulletin 1999/44

(51) Int. Cl.<sup>6</sup>: **G01N 15/14**, **G01N 21/64**,  
**G02B 7/00**

(43) Date of publication A2:  
04.02.1998 Bulletin 1998/06

(21) Application number: **97112321.1**

(22) Date of filing: **18.07.1997**

(84) Designated Contracting States:  
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC  
NL PT SE**

(30) Priority: **30.07.1996 US 692933**  
**30.07.1996 US 692931**  
**30.07.1996 US 688559**  
**30.07.1996 US 692934**  
**30.07.1996 US 692930**

(71) Applicant: **Bayer Corporation**  
**Pittsburgh, PA 15219-2502 (US)**

(72) Inventors:

- Gontin, Richard A.  
Rye, New York 10580 (US)
- Miers, David R.  
Vernon, New Jersey 07462 (US)
- Spangenberg, Peter E.  
Monroe, Connecticut 06468 (US)

(74) Representative:

**Kirchner, Dietrich, Dr.**  
**c/o Bayer AG**  
**Konzernbereich RP**  
**Patente und Lizenzen**  
**51368 Leverkusen (DE)**

**(54) Optical system for a hematology analytical instrument**

(57) An optical illuminator assembly for an analytical instrument, such as a clinical hematology or a flow cytometer instrument, and method of aligning the components of the illuminator assembly (130,381) and orienting the illuminator assembly (130,381). The illuminator assembly (130,381) includes a plurality of optical components, such as a laser source (131), e.g., a laser diode (131), optionally a spatial filter (185,190,195), a beam shaping aperture (201A,220A), and a focusing lens (220,387b). The optical components are mounted in or to a housing (121A,3020) and

are internally oriented with respect to the housing (121A,3020) to produce a focussed laser beam output. The housing is in turn mounted on an alignment mechanism (3040) which can move the focussed beam in four degrees of freedom, thereby to direct the focussed beam to a particular location. Thus, a factory alignment and a low cost prealigned optical illuminator assembly is obtained, which can be easily oriented for use in an instrument.

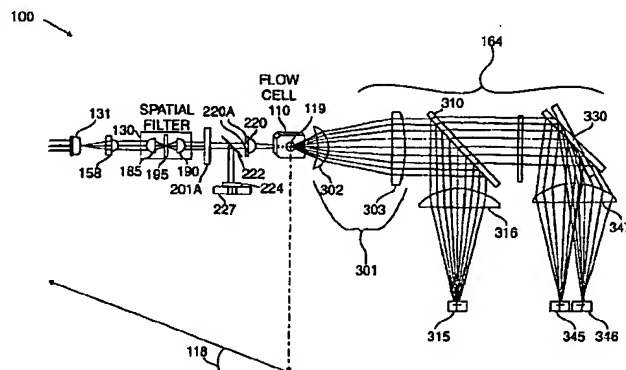


FIG. 1

EP 0 822 404 A3



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 97 11 2321

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	WO 93 05359 A (COMMW SCIENT IND RES ORG) 18 March 1993 (1993-03-18) * page 24 - page 25; figure 1 *	1,2	G01N15/14 G01N21/64 G02B7/00
A	EP 0 455 125 A (CANON KK) 6 November 1991 (1991-11-06) * the whole document *	1,2	
A	EP 0 501 008 A (TOA MEDICAL ELECTRONICS) 2 September 1992 (1992-09-02) * column 3, line 44 - column 4, line 47; figure 1 *	1,2	
X	EP 0 241 268 A (SCLAVO INC) 14 October 1987 (1987-10-14) * page 14, line 5 - page 19, line 21; figure 3 *	3	
X	EP 0 545 315 A (MILES INC ; SINAI SCHOOL MEDICINE (US)) 9 June 1993 (1993-06-09) * page 9, line 32 - page 11, line 20; figures 1B, 1E *	4,5	
Y		6	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
X	WO 94 22001 A (STEEN HARALD) 29 September 1994 (1994-09-29) * the whole document *	4	G01N G02B
Y		6	
Y	DE 20 45 196 A (SIEMENS AG) 16 March 1972 (1972-03-16) * page 2, paragraph 2 *	6	
A	US 4 038 556 A (AUER ROBERT EDWARD ET AL) 26 July 1977 (1977-07-26) * figures 2,3 *	7	
A	US 5 113 291 A (NAIKI TOSHIO) 12 May 1992 (1992-05-12) * figure 7 *	7	
		-/--	
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 9 September 1999	Examiner Müller, T
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons - : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P4/C01)



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 97 11 2321

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	WO 94 29762 A (COULTER CORP) 22 December 1994 (1994-12-22) * the whole document * -----	8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 9 September 1999	Examiner Müller, T
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (Pw/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 97 11 2321

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-09-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9305359    A	18-03-1993	AT    177200 T	15-03-1999
		AU    658669 B	27-04-1995
		CA    2116874 A	18-03-1993
		CN    1073007 A, B	09-06-1993
		DE    69228550 D	08-04-1999
		DE    69228550 T	19-08-1999
		EP    0602145 A	22-06-1994
		JP    7501397 T	09-02-1995
		NZ    244186 A	27-04-1995
		US    5530551 A	25-06-1996
		ZA    9206717 A	09-03-1993
EP 0455125    A	06-11-1991	JP    2675895 B	12-11-1997
		JP    4006465 A	10-01-1992
		JP    4036637 A	06-02-1992
		JP    4066873 A	03-03-1992
		DE    69117572 D	11-04-1996
		DE    69117572 T	26-09-1996
		US    5198369 A	30-03-1993
EP 0501008    A	02-09-1992	JP    1998424 C	08-12-1995
		JP    4270961 A	28-09-1992
		JP    7034012 B	12-04-1995
		CA    2050762 A	28-08-1992
		DE    69126120 D	19-06-1997
		DE    69126120 T	09-10-1997
		US    5159397 A	27-10-1992
EP 0241268    A	14-10-1987	US    4750837 A	14-06-1988
		US    4802768 A	07-02-1989
		JP    63079040 A	09-04-1988
EP 0545315    A	09-06-1993	US    5360739 A	01-11-1994
		AT    161953 T	15-01-1998
		AU    680143 B	17-07-1997
		AU    2483595 A	14-12-1995
		AU    2816792 A	10-06-1993
		CA    2077789 A, C	06-06-1993
		DE    69223931 D	12-02-1998
		DE    69223931 T	30-04-1998
		ES    2111600 T	16-03-1998
		IL    103055 A	13-07-1997
		JP    6180315 A	28-06-1994
		JP    8027277 B	21-03-1996
		US    5411891 A	02-05-1995

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 97 11 2321

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-09-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9422001 A	29-09-1994	NO 930980 A	19-09-1994
		AU 6386794 A	11-10-1994
		CA 2157665 A	29-09-1994
		EP 0689672 A	03-01-1996
		JP 8507865 T	20-08-1996
		US 5684575 A	04-11-1997
DE 2045196 A	16-03-1972	BE 772447 A	10-03-1972
		FR 2107511 A	05-05-1972
		GB 1350617 A	18-04-1974
		LU 63881 A	13-01-1972
		NL 7112081 A	14-03-1972
US 4038556 A	26-07-1977	AU 503801 B	20-09-1979
		AU 1684276 A	16-02-1978
		DE 2636470 A	22-12-1977
		DE 2660947 C	24-07-1986
		FR 2355284 A	13-01-1978
		GB 1561054 A	13-02-1980
		JP 1138094 C	11-03-1983
		JP 52153493 A	20-12-1977
		JP 57030221 B	28-06-1982
		NL 180704 C	
		NL 7609073 A, B	16-12-1977
US 5113291 A	12-05-1992	JP 1259309 A	17-10-1989
WO 9429762 A	22-12-1994	EP 0701707 A	20-03-1996
		JP 8511347 T	26-11-1996
		US 5610712 A	11-03-1997